Abstract of the Invention

The present invention discloses a method and system for charging a metal hydride bed, wherein the metal hydride bed contains a hydrogen storage material. The metal hydride bed is charged using a chemical hydride slurry having a metal hydride, a stabilizing agent and water. As the slurry contacts the metal hydride bed, a catalyst in the metal hydride bed promotes a reaction between the metal hydride of the slurry and water. The reaction produces atomic hydrogen and byproducts. At least a portion of the atomic hydrogen is absorbed by the hydrogen storage material and the remaining atomic hydrogen is disposed from the system or used as fuel in a hydrogen fueled apparatus, such as a fuel cell.